



ON EX

ISOLATED BONE

PRESERVING A

GEORGE BUCH

NOTE ON THE ANATOMICAL STUDY

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JOHN OLIVER AND B

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ON EXCISION  
OF  
ISOLATED BONES OF THE TARSUS,  
PRESERVING A USEFUL FOOT.

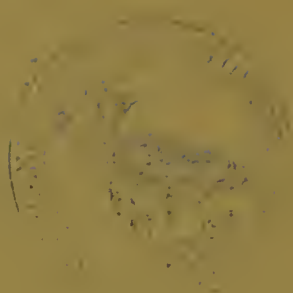
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*Read before the Glasgow Medico-Chirurgical Society.*

EDINBURGH OLIVER AND BOYD, TWEEDDALE COURT.

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## EXCISION OF ISOLATED BONES OF THE TARSUS.

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SEVERAL cases having recently occurred in my practice in which excision of isolated bones of the tarsus has been followed with a fortunate result as regards the use of the foot, I take the opportunity to bring the subject before my professional brethren, as one deserving of the most careful consideration. There is nothing new or uncommon in the proposal, but I fear that there is a very general tendency on the part of surgeons to the belief that disease of the tarsus is so apt to attack more than one bone, that in most cases it is better at once to amputate at the ankle than to perform a partial operation which may soon be followed by the other. And I believe that the great success which attends amputation at the ankle is one of the causes of this conclusion. Few operations in surgery of similar importance can compare with that referred to. Most surgeons in hospital practice can quote scores of cases successively without an unfortunate result; and this almost certainty of success is very apt to induce a surgeon to sacrifice the foot rather than submit the patient to the other, with success only problematical and recovery always tedious.

Now, I am perfectly aware that in certain forms of disease, amputation is the preferable proceeding, even though only one bone be affected, and equally convinced that in such circumstances, if the bone be one of the anterior row, Chopart's operation should not be chosen. At present I leave out of consideration disease of the metatarsus and phalanges—I am limiting my remarks to the tarsal bones. Examples are constantly occurring of partial operations being followed by a recurrence of disease demanding amputation. On the other hand, I have seen an amputation performed in a case in which the subsequent examination of the foot disclosed a condition in which, had a partial operation been chosen, recovery would have been certain.

An easy way to get out of the difficulty, of course, is, to do the partial operation first, and, if not successful, to proceed to the major—or to begin the incision so as to remove the diseased bone, and then, if it turns out on closer examination that the adjoining

bones are implicated, to go on to the amputation. And in some cases it is necessary to adopt this plan. But, if at all possible, it is much more satisfactory to determine beforehand the extent of the operation you propose to perform.

Now, there are certain conditions of the bones of the tarsus in which it is hopeless to attempt a partial operation, even though disease be limited apparently to one bone. Spontaneous idiopathic caries commencing in the bone substance—most commonly in strumous constitutions—usually makes its appearance in one bone, and it may go through its stages of swelling, softening, suppurating, ulcerating, erosion, discharge; leaving the characteristic sinus with puffy lips, and all the time there may be no evidence of any adjoining bone being similarly affected. If such a bone be excised, the cartilage on its articular extremities may be apparently sound, and the cartilaginous coverings of the articulating bones may give no evidence of disease, but in a few weeks the disease appears in other bones much as it did in the first, apparently in the same spontaneous way. The disease did not spread from the bone first removed, but was latent or even partially developed simultaneously. Many a time have I demonstrated to the students, in the operating theatre, the statement above made. After amputation of the foot for caries, apparently limited to one bone—say the scaphoid—I have sawn the foot longitudinally from the great toe to the os calcis, and similarly along the outer third of the foot, and shown every articular cartilage in the tarsus, of its proper colour and smoothness, and yet the bones, every one, in a state of incipient or partially advanced caries. In such a case, excision of the first affected bone will be of no avail, for the disease is already in the other bones. The only exception to this general statement is the os calcis, which sometimes becomes affected with caries, independent of the rest of the tarsus, and may be removed. Of this more in the sequel.

With regard to caries arising in the tarsus, as the result of a wound or other injury, the conclusion is not to be so sweeping as in the former case, and the opinion must be guided a good deal by the general constitution of the patient, and allied circumstances; but it must be borne in mind that such injuries, though only primarily affecting the part of the foot on which they were inflicted, may be the means of lighting up the disease in the whole tarsus.

But though caries, either spontaneous or as the result of accident, is by far the most common disease of the tarsal bones, yet not unfrequently they are affected with necrosis. The bone is denuded of periosteum, and a probe introduced through a sinus detects a bare rough surface; but it is hard and gritty, not spongy and porous, like a carious bone. It is very often dark in colour, and on being removed and washed has much the appearance of a cinder. The bone often lies in a bed of velvety granulations, which have sprung up to isolate it from the adjoining tissues. Such a

case I have known to be mistaken for caries, and have seen a foot amputated, from which, when thrown down, the isolated necrosed bone fell out, having been lying loosely in its bed of granulations. In such a case, excision of the bone, even though it be held pretty firmly in its place by the surrounding bones or tendons passing over it, could be undertaken with a certainty of a good result. This form of disease in bones of cancellated tissue is most commonly the result of accident, which sets up suppurative periostitis leading to necrosis.

Here, then, are two distinct forms of disease—viz., spontaneous caries, and circumscribed necrosis of the tarsal bones—which, when recognised, demand, the first, amputation of the whole foot; the second, excision of an individual bone.

But while the above opinion guides my practice in cases so well defined as those to which I have alluded, there are others in which partial operations will remove the disease and save the foot, especially in reference to disease of the os calcis and in young persons. The discussion of this subject, however, will lead me away from the special object of this paper, which is to give an account of some cases in which removal of isolated bones of the tarsus has been followed by most gratifying results as to the preservation and use of the foot.

1. *Excision of Astragalus*.—Annie McGregor, age 27. Admitted 30th August 1875. Three and a half years previous to admission patient suffered a severe sprain of the ankle-joint. This was attended to for a few days, but absolute rest was not observed, as she began to walk about shortly after the accident. During the year which followed, pain was almost constantly experienced in the joint, but not of a character so severe as to render her unable to walk. The pain, however, after this time became more intense; so much so, that she could not even place her foot on the ground or exercise the slightest motion, without increasing it. At this period, also, there occurred a swelling of the joint, which was ultimately lanced, thus giving exit to a large quantity of pus, which continued to be discharged for some time after from the openings which resulted.

On admission, the joint and foot were much swollen. Some pain was complained of on movement of the joint. There were two small openings seen, one situated on the anterior, the other on the posterior aspect of the external malleolus, and giving exit to a small quantity of matter.

*Treatment*.—Hot fomentation, small blisters, and rest, by the limb being confined in a McIntyre's splint.

1st October.—Although the patient has experienced some relief by the perfect rest of the joint, in other respects there was no visible change. The probe introduced into the sinuses detects bare bone rough and hard, indicating that the astragalus was denuded of periosteum, though it had not the spongy feeling produced by a carious bone.



8th Oct.—Excision of the astragalus was performed as follows after the manner described by my father in the volume of the *Glasgow Medical Journal* for 1854:—

I made a semilunar incision on the outer aspect of the ankle, commencing at the outer edge of the tendo Achillis on the level of the external malleolus, and extending below the malleolus as far forward as the peroneus tertius' tendon. This was dissected up, and the tendons of the peroneus longus and brevis divided. The external malleolus was then sawn through, and the foot twisted inwards till the upper surface of the astragalus looked outwards. No difficulty was experienced in disarticulating the astragalus from its connexion with the os calcis and removing it. The upper surface of the calcis was a little rough, so I removed with a saw a thin slice of that bone. The articular surface of the tibia was covered with granulations, and did not require to be interfered with.

The foot was now replaced and the wound dressed antiseptically. Perfect rest was secured by the limb being placed in a M'Intyre's splint.

The recovery was tedious, but on the 4th February, when the patient was shown at a meeting of the Medico-Chirurgical Society, the cavity left by the removal of the astragalus was quite filled up, and the patient able to exercise flexion and extension of the joint.

2. *Excision of the Astragalus for Necrosis, after complete Dislocation backwards and Twisting of the Bone.*—This case is reported in Mr Hancock's book on the Surgery of the Foot, page 247. The particulars need not be here repeated, but it is sufficient to state that the patient recovered, with a useful foot, being able to walk without the aid of a stick.

3. *Excision of the Cuboid Bone.*—E. Barbour, aged 5, got her foot strained in November 1874 by her mother drawing a tight boot rather quickly from her foot. Shortly after, a swelling appeared on the outer side of the foot, which softened and burst, discharging pus. Since then, a sinus has remained, opening, though occasionally nearly closing. In May 1875, Dr Chalmers asked me to see it, and on introducing a probe into the sinus, the cuboid bone was distinctly felt—bare, rough, but not spongy, while the bones around seemed unaffected.

Excision of the cuboid was very easily performed by making a crucial incision, of which the sinus was the central point. When the flaps were turned out, there was no difficulty in levering the bone out of its place. The recovery was tedious, owing to the formation of small abscesses in the sole; but ultimately the foot was restored to all its functions, and at present there is little trace of the operation. I have no doubt that part of the cavity is filled up with granulations from the periosteum.

4. *Excision of the Os Calcis.*—J. Fulton, aged 8 years. This case occurred several years ago. The patient was placed under my care



by Dr Fergus. He received a strain of the ankle, which, in a few days, was swollen and painful. On the third day, there was a large red fluctuating swelling all around the os calcis. I placed the patient under chloroform, and made a long incision along the outer edge of the os calcis; a large quantity of pus escaped, and I found the bone bare and rough. I made a second incision from the first to the external malleolus, and, turning back the soft tissues without trouble, removed the bone from its connexion with the astragalus and cuboid, and extracted it. The recovery as usual was tedious, but the foot was preserved. (The patient, who was present, walked up and down the hall.)

5. *Excision of the Os Calcis*.—J. H., aged 12, was admitted to the Western Infirmary on the 23d July. There was the history of an abscess which had formed on the outer aspect of the heel, had burst, and the opening remained patent.

On admission, there was a sinus in the outer aspect of the heel through which the probe can be introduced, and it detects the bone bare and rough, but not spongy.

Dr Patterson, who had charge of my wards during my holidays, scooped out the bone with a gouge, in the hope that the parts would put on healthy action and granulate. On the 11th October, there was no progress toward recovery, and the bone was found in much the same state as on admission. I therefore proceeded to excise the os calcis by a method which I have followed on previous occasions, and which is described in Mr Hancock's book at page 414. The incisions are made so as to leave the integuments and soft parts suitable for conversion into a proper covering for amputation, if the disease is found more extensive than anticipated; also to avoid the vessels and nerves of the foot. The operation is conducted as follows:—Enter the point of a strong knife at the external malleolus, carry it down perpendicularly to the outer edge, and then two-thirds across the sole, about an inch and a half in front of the heel. At right angles to this make an incision along the outer side of the foot at a point a little in front of the calcaneo-cuboid joint. The two angular flaps are to be dissected off from the bone till the external and inferior surfaces of the calcaneum are nearly exposed. The posterior flap can now be turned back over the projecting heel and the tendo Achillis cut. By dividing the middle fasciculus of the external lateral ligament, the bone can be twisted so as to expose the calcaneo-cuboid articulation, which can be opened with the point of the knife, and then the whole bone can be forcibly twisted inwards, the interosseous ligaments between the calcaneum and astragalus being divided as they are put on the stretch. When the disarticulation is completed, the soft parts, with the vessels and nerves on the inner side, can be separated without any risk of injury. The operation was done antiseptically, and dressed in the same way. By the 17th December, the wound had completely

closed, and the gap caused by removal of the bone much filled up—probably the periosteum, which was in great part stripped from the bone along with the soft tissues, was the source of some of the granulations with which the cavity was filled up. The patient was able to walk with ease, flexion and extension of the ankle being almost perfect.

These examples are all of necrosis of the tarsal bones, and my experience of excision with a fortunate result is limited to that form of disease, except in the case of the os calcis. The last is an example of a form of necrosis to which I have applied the term “progressive,” and which is described in a letter to Mr Hancock, and quoted in his book, page 395.

For some reason, true spontaneous caries of the calcaneum is not so apt to be accompanied by similar disease in the other tarsal bones as when it appears first in another bone; and when caries is lighted up by injury, it is longer limited to the os calcis than in the case of another bone. Hence gouging out the calcaneum in cases of caries sometimes is sufficient to remove the disease, and in more extensive examples, excision has saved the foot.

I consider, then, that disease of the os calcis is an exception to the general statement that true caries of the tarsal bones demands amputation. In a few instances, I have saved the foot by gouging, and in others by excising a carious os calcis; but I have not been able to get a patient to exhibit as an illustration, and therefore do not intend to allude further to the subject.

The purpose of my paper is served if I have demonstrated by actual examples that a useful foot may be preserved after pretty severe mutilation, if the proper cases can be selected.



